

Amendments to the Drawings:

The drawing sheet attached in connection with the above-identified application containing newly added Figure 4 is being presented as a new drawing sheet.

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

In the specification, paragraphs have been amended on pages 4 and 6.

Claim 15 is requested to be cancelled.

Claims 10, 11, 14, 16 and 20 are currently being amended, and new claims 25-31 are being added.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 10-14, 15-23 and 25-31 are now pending in this application.

New Drawing Figure

As required by the PTO, Applicants have submitted a new drawing Figure 4 to illustrate the subject matter described on page 6, lines 7-25, of the original application. That paragraph of the specification has also been amended to add several new reference numerals, and the brief description of the drawings on page 4 of the application has been amended to refer to the new figure of drawings. No new matter has been added, as can be readily seen from the nature of the specification amendments.

Section 112, 2nd Paragraph Rejection

Claim 16 has been amended to clarify the relationship between the first and second webs and the corresponding first and second embossments.

Independent claims 10 and 11 have been amended to clarify the scope of the claims, in response to the helpful comments set forth in the Office Action, as discussed below.

It is believed that the language of the claims fully satisfies the requirements of 35 U.S.C. § 112, paragraph 2. Reconsideration and withdrawal of the rejection are therefore respectfully requested.

Rejections Based on Prior Art

It is also respectfully requested that the rejection of claims 10-15 and 19-21 under 35 U.S.C. § 103 based upon FR 27 80 153 ("FR '153") in view of certain alleged AAPA or, in the case of claims 16-18, in view of US 5,704,423 to Letrange ("Letrange") be reconsidered and withdrawn. For reasons set forth below, Applicants respectfully submit that the claims are patentable over the cited prior art.

As understood from the comments in the Office Action regarding the functional and/or allegedly indefinite nature of certain recitations in the claims, it appears that the basic issue underlying the repetition of the rejection is the allegation that the claims do not *structurally* differentiate from the cited prior art, because of the presence of functional language. Applicants respectfully disagree and submit that the claims, as they stood previously, but especially as amended above for clarity, properly define an invention that is not rendered "obvious" by the cited art. Claim 10 has been recast in "means-plus-function" terminology in order to place the functional part of the definition into a form that clearly must be given weight by the PTO, i.e., the PTO must look to see if the structure of the prior art is the same or equivalent as that disclosed in the present specification *and* if the prior art structure performs the recited function.

It is clear that the structure shown in the prior art does not and cannot function in the manner recited in the claims, and further that the prior art (which has a completely different purpose) likewise does not teach the claimed invention. Thus, in the absence of an anticipating structure in the prior art (as acknowledged), there is certainly nothing in the prior art that "teaches" the claimed invention and its mode of operation, which is different from that of the prior art FR '153 reference. In other words, there is nothing present in the prior art to bridge the gap between a rejection for anticipation (which has not been made) and a "teaching" sufficient to suggest the presently claimed structure.

Claim 10 patentably differentiates structurally over the design shown and described in FR '153 in the following respects. Claim 10 defines "means, located in the opposing tube

wall, for compensating by deformation for varying lengths of the at least one web without increasing the external thickness dimension of the tube, said compensating means including an embossment which is directed toward the inside of the tube, and which forms a surface that contacts the end of the at least one web and has a width and a configuration sufficient so that the surface is deformed to compensate for variations in length of the at least one web..” The structure shown in FR ‘153 does not meet this definition and does not and cannot function in the same way as the claimed invention.

FR ‘153 shows a multi-chambered flat heat exchanger tube in which a V-shaped depression 32 is formed when the tube wall 12 is folded in and layers 20 and 22 are joined together to form the “web” that extends to the opposite side of the tube interior. A corresponding V-shaped indentation 34 is formed in the opposite tube wall 14. Contrary to the PTO’s assertion, this indentation 34 has a basically triangular shape, which renders it non-deformable. Even if one observes the “rounded” shape of the peak of the triangular indentation 34, this structure is not capable of compensating for excess length of the web 20/22, since the width of the peak is very short (such that it cannot deform very far, if at all) and the slanted walls of the V-groove cannot deform inwardly toward one another. The only type of deformation possible with the disclosed V-groove is a deformation of the entire structure in the direction of the outside wall of the tube, which will cause a distortion in the outside dimensions of the tube itself. This is just what the present invention is intended to avoid, as it interferes with the continuous bonding of the fins to the tube! (See further comments below regarding the “reinforcement” purpose of the V-groove according to FR ‘153.)

Moreover, the indentation is placed in the tube of FR ‘153 for a completely different purpose than the embossment of the present invention. First, the purpose of providing two identical V-shaped indentations in opposing tube walls is to provide symmetry to the tube, i.e., so that assembly into the heat exchanger is simplified due to the fact that it is not necessary to first orient each tube in the same orientation (i.e., with all of the single-grooved sides facing in the same direction). Obviously, this is avoided if the two sides are symmetrical. See pages 1 and 2 and claim 7 of FR ‘153. Since the objective is to have indentation 34 match the V-shape that is necessarily formed by the creation of indentation 32,

it would clearly not be suggested to provide a different shape for indentation 34, i.e., clearly not a shape such as is used according to the present invention.

The further implication of the FR '153 specification is that the V-shaped indentation 34 is put into the tube of that reference as a kind of reinforcing structure, to maintain the integrity of the joint formed at the end of the web, i.e., to avoid a breach between the separate and parallel tube passageways 24 and 26. See page 4, line 37 through page 5, line 17 of FR '153. Again, such a purpose for the indentation 34 is antithetical to the purpose for which the embossment is provided according to the present invention, i.e., to provide a "deformable" structure to compensate for tolerance variations of the web.

Consequently, not only does the FR '153 reference not disclose the structure and purpose of the embossments claimed in the present application, but the cited reference actually teaches away from any structure other than the V-shaped indentation disclosed therein, and ascribes a "reinforcement" purpose to the V-groove, which is just the opposite of the deformation function of the present invention. The FR '153 reference cannot, therefore, render "obvious" the presently claimed invention.

Claim 11 has been rewritten in independent form (and amended for further clarity). It recites additional structure, e.g. "a plateau," as well as specific dimensional relationships for the embossments according to the invention. Neither a "plateau" nor the recited dimensional relationships are taught or can be achieved according to FR '153, i.e., while still being consistent with the V-shaped profile that is required to match the V-shaped profile of seam 32. A narrow rounded point of the V-groove hardly qualifies as a "plateau" having a width at least twice the thickness of the sheet material. See Figure 3 of FR '153. The recited dimensional relationships also have a purpose that is not suggested (and not achieved) by the structure shown in FR '153, namely, to compensate for excess length of the web and, in a preferred embodiment, to also avoid the production of a discontinuous solder junction between the tube and subsequently applied heat exchange fins (as now claimed in claims 25-27). The dimensional relationships set forth in these claims are structural features that are unequivocally not shown in the cited art, and since they have an intended purpose that brings about advantages for the claimed product, these features are undeniably relevant to demonstrating patentability over the prior art.

The Letrange reference does not rectify the deficiencies that have been noted above with respect to the FR '153 reference. A combination of these two references does not provide a proper basis to support a *prima facie* case of obviousness of the claimed invention.

In summary, the PTO acknowledges that the claims do not "read on" FR '153 but fails to acknowledge that there is no "teaching" of the claimed invention in the reference, i.e., based on the fact that the reference expressly teaches a V-shaped groove 34 to match the corresponding V-shaped groove 32 on the opposite side of the tube. The PTO also fails to accord proper weight to the teaching in FR '153 that the V-groove 34 plays a "reinforcing" role, which is the antithesis of the "deformation" role played by the embossment according to the present invention. Thus, not only does FR '153 not "teach" the present invention, but it rather *teaches away from* the present invention. Finally, to the extent that the PTO previously improperly ignored certain language of the claim as being allegedly "functional," the claims have been amended for clarity and to emphasize the *structural* nature of the differences vis-à-vis the prior art, e.g., by couching the function in terms of a means-plus-function expression in claim 10.

In view of these comments, it is respectfully submitted that newly presented independent claims 10 and 11, as well as all of the remaining claims that depend therefrom define subject matter that is patentable over the cited prior art. Further and favorable action in the form of a Notice of Allowance of all claims is believed to be next in order, and such action is courteously solicited.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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By 

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